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ABSTRACT

In order to determine the economic impact of a college on its local community, the short-term cash-flow relationships are translated into models representing the economic components and the transactions that typically occur. A series of models derived from an American Council on Education publication are presented for the use of higher education professionals in Vermont. They are presented in the form of equations, to which the user may apply the relevant data collected for his own institution or community. The models represent these economic activities: college related local business volume (local expenditures by the college, faculty and staff, students, and visitors to the college), and college-related revenues received by local governments (taxes and other payments by the college, taxes and other payments by student living groups, and property and non-property taxes and other payments by faculty and staff). An appendix lists the equations' variables and the data elements they represent, and suggests sources for the data. Notes on the multiplier effect in economic transaction are also appended. (MSE)

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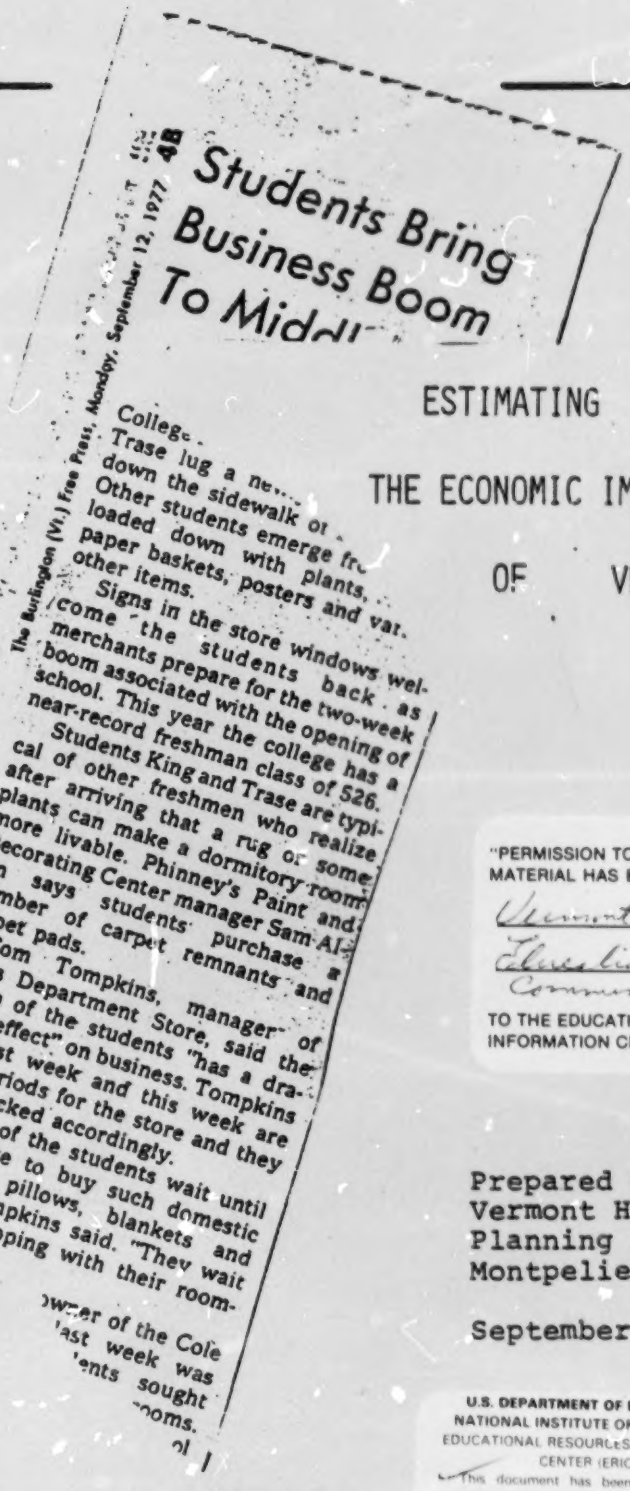

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Students Bring Business Boom To Middl...

The Burlington (Vt.) Free Press, Monday, September 12, 1977

College... Trase lug a ne... down the sidewalk of... Other students emerge fr... loaded down with plants, paper baskets, posters and var... other items.

Signs in the store windows wel... come the students back as merchants prepare for the two-week boom associated with the opening of school. This year the college has a near-record freshman class of 526. Students King and Trase are typical of other freshmen who realize after arriving that a rug or some plants can make a dormitory room more livable. Phinney's Paint and Decorating Center manager Sam Allen says students purchase a number of carpet remnants and carpet pads.

Tom Tompkins, manager of Ames Department Store, said the return of the students "has a dramatic effect" on business. Tompkins said last week and this week are peak periods for the store and they have stocked accordingly.

Many of the students wait until they arrive to buy such domestic items as pillows, blankets and sheets, Tompkins said. "They wait and go shopping with their roommates."

...ernard ...owner of the Cole ...last week was ...ents sought ...ooms.

...ol

ESTIMATING THE ECONOMIC IMPACT OF VERMONT INSTITUTIONS ON THEIR LOCAL ECONOMIES

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September 1977

Introduction

The value of higher education is often expressed in terms of the benefits derived from a better educated citizenry or the increased earning power of a college graduate. The community surrounding an institution of higher education may appreciate the accompanying cultural benefits such as plays, musical performances, art exhibits, or guest lecturers, or a local storekeeper may be well aware of his dependence on college-related business. But seldom is the broad economic relationship between a college and its surrounding community fully understood. What goods and services does the college purchase in the community? How much local housing is rented by the faculty, staff and students? What impacts do visitors to the college have on the local economy?

The economic models presented here are derived from the American Council on Education's publication, Estimating the Impact of a College or University on the Local Economy, by John Caffrey and Herbert H. Isaacs. The Caffrey-Isaacs model addresses a wide variety of factors and effects, but its complexity and man-hour requirements may discourage its use by smaller institutions where the staff or the necessary expertise is not readily available.

The following models consider the short term cash-flow relationships comprising the bulk of an institution's impact on the local economy. Long term impacts such as the impact of student demand deposits on the local banks' credit base require the collection of data not readily available to the college staff and are not considered in this basic expenditure impact model. The net effect of removing similar long term factors from consideration is minimized because such factors are both positive and negative and tend to cancel each other out. The outcomes of this abbreviated model will not differ significantly from those of the more elaborate model. What is sacrificed is the high degree of credibility commanded by a sophisticated and in-depth study. Nevertheless, this simplified model will yield a reasonable estimate of the impact of a small or moderate size college on the local economy.

USING THE MODELS

In order to determine the economic impacts of a college on its local community the various economic relationships have been translated into models representing the economic components and the transactions which typically occur. Each model represents a short-term cash flow activity and may be amended by the user, if by doing so the model will more closely resemble the economic activity being examined. The models are presented in the form of equations using algebraic notations to describe the arithmetic necessary to perform the calculations. The user's major task will be to collect the data from sources such as records of college expenditures, town records, and estimates or surveys of staff and students spending patterns. The basic data elements and suggested sources are listed in Appendix A on page 17.

There are two types of data elements used in these models: real numbers and proportions. The real numbers are symbolized by upper case letters, such as "C" representing total college expenditures. Proportions are symbolized by lower case letters and are expressed as fractions or their decimal equivalent. If 80 out of 100 students live on campus, then the proportion of students living on campus is 80/100, .8, or 4/5.

The general acceptance and credibility of an institution's estimate will be directly related to the accuracy of the data used. Most data elements will be taken from existing records and may be plugged directly into the appropriate equations. Other data elements may not be readily available and must be derived from surveys or from judgements made by the user. For example, data on the proportion of the student body renting private housing in the community may already be available from existing records. If not, the user has the option of obtaining the data by administering a campus-wide survey, a partial "sampling" survey, or by simply making a judgement.

When deciding which means will be employed to obtain the data the user should consider the degree

of statistical uncertainty which may be tolerated in the final estimate and still serve the estimate's intended purpose. If an estimate is to be used for general public informational purposes a ballpark figure computed by using estimates of the unknown values will probably suffice. In such cases, data based on administrative estimates or judgements should be sufficiently conservative to enable the user to defend the estimate in the absense of elaborate documentation. The user must strike a balance between the pragmatic considerations of compiling the data elements and the institution's need for accuracy in the measure of its economic impact on the surrounding community.

OUTLINE OF MODEL COMPONENTS

Each activity listed below is represented by an equation or set of equations presented in the next section.

College Related Local Business Volume

I. Local Expenditures by College

II. Local Expenditures by Faculty and Staff

1. Expenditures by Faculty and Staff for Local Rental Housing

2. Local Non-housing Expenditures by Faculty and Staff

III. Local Expenditures by Students

3. Local Expenditures by Students for Off-Campus Rental Housing and Food

4. Local Non-housing Expenditures by Students in Group Living Arrangements

5. Local Expenditures by Students other than Room, Board, and College Charges

IV. Local Expenditures by Visitors to the College

College Related Revenues Received by Local Governments

V. Taxes (and Other Payments) by College to Local Government

VI. Taxes (and Other Payments) by Student Living Groups to Local Government

VII. Taxes (and Other Payments) by Faculty and Staff to Local Government

6. Property Taxes paid by Faculty and Staff to Local Government

7. Non-Property Taxes Paid by Faculty and Staff to Local Government

ECONOMIC MODELS

EQUATIONS AND WORKSHEETS

College-Related Local Business Volume

I. Local Expenditures by the College

= p(C-W-X-T)

When:

p = the PROPORTION of total college expenditures that are local, excluding wages and salaries

C = total college expenditures

W = gross compensation to faculty, staff and students

X = internal account transfers and payments

T = taxes and other payments to governments

Statewide Expenditures
by the College (modify "p") =

II. Local Expenditures by Faculty and Staff

= the sum of 1. and 2. (below)

1. Expenditures by faculty and staff for local rental housing

= (f)(h)(I)

When:

f = PROPORTION of faculty and staff renting local housing

h = PROPORTION of faculty and staff income spent on rental housing

I = total net income of faculty and staff (gross income minus mandatory taxes and deductions)

(Local Expenditures by Faculty and Staff - Continued)

2. Local non-housing expenditures by faculty and staff

= (n)(l)(I)

When:

n = PROPORTION of faculty and staff income spent on non-housing items

l = PROPORTION of faculty and staff income spent locally for non-housing items

I = total net income of faculty and staff (gross income minus mandatory taxes and deductions)

Statewide non-housing expenditure by faculty and staff (modify "l") =

III. Local Expenditures by Students

= the sum of 3., 4., and 5. (below)

3. Local expenditures by students for off-campus rental housing and food

= S(H+F)

When:

S = number of students renting local housin

H = average local rental cost per student per year

F = average local off-campus expenditures for food per student per year

(Local Expenditures by Students - Continued)

4. Local non-housing expenditures by students in group living arrangements

= g(G)

When:

G = total operating and food expenditures of local living groups per year

g = PROPORTION of non-housing expenditures spent locally by student living groups

Statewide non-housing expenditures by students in group living arrangements (modify "g") =

(Local Expenditures by Students - Continued)

5. Local expenditures by students other than room, board and college charges

   = E(N+P)

   When:

   N = number of full-time students

   P = number of part-time students residing in campus housing and student living groups

   E = average local expenditures per student, excluding room, board and college charges

Statewide expenditures by students other than room, board, and college charges (modify "E") =

IV. Local Expenditures by Visitors to the College

= V(L)

When:

V = number of person-visits to the college per year

L = average local expenditures per person-visit

(User may wish to calculate visitor expenditures for each catagory of visitor, e.g. recruiters, parents, alumnae)

Total College-Related Local Business Volume

= the sum of I, II, III and IV (above)

I. Local expenditures by college =

II. Local expenditures by faculty and staff (sum of 1. and 2.) =

III. Local expenditures by students (sum of 3., 4. and 5.) =

IV. Local expenditures by visitors =

Total College-related business volume =

College-Related Revenues* Received by Local Governments

V. Taxes and Other Payments by College to Local Governments

= T (used in model I.)

VI. Taxes and Other Payments by Student Living Groups to Local Governments

= Q

VII. Taxes and Other Payments by Faculty and Staff to Local Governments

= the sum of 6. and 7. (on following pages)

Taxes and Other Payments by College to State Government =

Taxes and Other Payments by Student Living Groups to State Government =

*Do not include income tax, social security, or other funds which are withheld and forwarded to governments.

(Taxes and Payments by Faculty and Staff - Continued)

6. Property taxes paid by faculty and staff to local governments

$$= \left[K(1-f)\right]\left[A\left(\frac{B}{D}\right)\right]$$

When:

K = number of faculty and staff local households

f = PROPORTION of faculty and staff who rent housing

A = average local property tax rate

B = total assessed valuation of all local private residences*

D = total number of local private residences

*Be sure to adjust this value (if necessary) to be compatible with the tax rate base.

(Taxes and Payments by Faculty and Staff - Continued)

7. Non-property taxes paid by faculty and staff to local governments

$$= M\left(\frac{Y}{J}\right)$$

When:

M = number of local faculty and staff

Y = total non-property taxes paid to local governments

J = total number of local non-property taxpayers

Total College-Related Revenues Received by Local Governments

= the sum of V, VI and VII

V. Taxes and other payments by college =

VI. Taxes and other payments by student living groups =

VII. Taxes and other payments by faculty and staff (the sum of 6. and 7.) =

Total College-Related Revenues =

+

Total College-Related Business Volume (from page 12) =

College-Related Revenue and Business Volume =

Multiplier Effect (see Appendix B, page 20) = ×

TOTAL ESTIMATED ECONOMIC IMPACT =

APPENDIX A

Data Elements and Suggested Sources
(Alphabetically by Symbol)

Symbol	Data Element	Source
A	Local property tax rate (average)	Town records
B	Total assessed valuation of all local private residences	Town records
C	Total college expenditures	College records
D	Total number of local private residences	Town records
E	Average local expenditures per student per year excluding room, board and college charges	Survey or Judgement
F	Average local off-campus expenditure for food per student per year	Survey or Judgement
f	Proportion of faculty and staff renting local housing	Survey or Judgement
G	Total operating and food expenditures of local student living groups per year	Survey or Judgement
g	Proportion of non-housing expenditures spent locally by student living groups	Survey or Judgement
H	Average local rental cost per student per year	Survey or Judgement
h	Proportion of faculty and staff income spent on local rental housing	Survey or Judgement
I	Total net income of faculty and staff (gross income minus mandatory taxes and deductions)	College records
J	Total number of non-property taxpayers	Town records
K	Number of faculty and staff local households	College records, Survey or Judgement

Symbol	Data Element	Source
L	Average local expenditures by each visitor	Survey or Judgement
l	Proportion of faculty and staff income spent locally for non-housing items	Survey or Judgement
M	Number of local faculty and staff	College records
N	Number of full-time students	College records
n	Proportion of faculty and staff income spent on non-housing items	Survey or Judgement
P	Number of part-time students residing in campus housing and student living groups	College records, Survey or Judgement
p	Proportion of total college expenditures, excluding wages, salaries, internal items, and taxes, that are expended locally	College records
Q	Taxes (and other payments) by student living groups to local government	Survey, Town records, or Judgement
R	Local property taxes paid by college	College records
S	Number of students renting local housing	College records, Survey or Judgement
T	Taxes (and other payments) by college to local governments	College records
V	Number of visitors per year to college	Survey or Judgement
W	Gross compensation to faculty, staff, and college-employed students	College records

Symbol	Data Element	Source
X	Internal account transfers and payments	College records
Y	Total non-property taxes paid to local governments	Town records

APPENDIX B

The Multiplier Effect

The multiplier effect is illustrated by the following example. When a dollar is spent at the local store a portion of that dollar will leave the local economy immediately, paid out as state or federal taxes, utility costs, and payments to non-local suppliers. Other portions of that dollar will remain in the local economy as income for the clerk and as profits for the storeowner and local wholesaler. The clerk and local business people in turn will spend a portion of their incomes within the local economy "multiplying" the local impact of the original dollar spent.

The magnitude of the multiplier effect will vary from one community to the next, and may even vary seasonally within some communities. The multiplier effect is an abstraction which cannot be measured directly, at best it can only be estimated.

In general, a metropolitan area will have a larger multiplier (2.0 to 3.0) than a small, rural town (1.2 to 1.5) reflecting the tendancy of a dollar to circulate longer within the larger, more diversified economy before leaving it.

Use of the Multiplier

As noted above, the magnitude of the multiplier effect within a given community may fluctuate from time to time. Also, expenditures in different segments of a communitys' economy will have differing impacts on the overall economy. For example, a school may have direct access to local wholesale goods, thus by-passing the local retailer and reducing the multiplier value of those expenditures. On the other hand, expenditures made by visiters to local service industries, such as restaurants and motels, tend to stay in the local economy longer, increasing their impact.

The Caffrey-Isaacs model suggests that an appropriate multiplier be used for each type of college-related expenditure. An "income" multiplier

would be applied to calculate the impact of staff salaries and wages; an "employment" multiplier would be applied to local expenditures to estimate the number of local jobs generated by those expenditures; and so on for each type of impact.

The simplified model presented here uses a single multiplier to be applied to the sum of the "College-Related Local Business Volume" and "College-Related Revenues Received by Local Governments." The magnitude of the multiplier used should be conservative and defensible.

We recommend that Vermont schools use multipliers ranging from 1.2 for the most rural settings to 1.6 for economically active moderate-size towns, and schools in the Burlington area use a multiplier of 1.8 to 2.0.